

CLAIMS

What is claimed is:

1. An isolated nucleic acid fragment encoding a 3-dehydroquinate synthase comprising a member selected from the group consisting of:

- 5                   (a) an isolated nucleic acid fragment encoding an amino acid sequence that is at least 80% identical to the amino acid sequence set forth in a member selected from the group consisting of SEQ ID NO:2, SEQ ID NO:4, SEQ ID NO:6 and SEQ ID NO:8;
- (b) an isolated nucleic acid fragment that is complementary to (a).

10           2. The isolated nucleic acid fragment of Claim 1 wherein nucleic acid fragment is a functional RNA.

3. The isolated nucleic acid fragment of Claim 1 wherein the nucleotide sequence of the fragment comprises the sequence set forth in a member selected from the group consisting of SEQ ID NO:1, SEQ ID NO:3, SEQ ID NO:5 and SEQ ID NO:7.

15           4. A chimeric gene comprising the nucleic acid fragment of Claim 1 operably linked to suitable regulatory sequences.

5. A transformed host cell comprising the chimeric gene of Claim 4.

6. A 3-dehydroquinate synthase polypeptide comprising all or a substantial portion of the amino acid sequence set forth in a member selected from the group consisting of SEQ ID NO:2, SEQ ID NO:4, SEQ ID NO:6 and SEQ ID NO:8.

20           7. A method of altering the level of expression of a 3-dehydroquinate synthase in a host cell comprising:

- (a) transforming a host cell with the chimeric gene of Claim 4 and
- (b) growing the transformed host cell produced in step (a) under conditions
- 25                   that are suitable for expression of the chimeric gene
- wherein expression of the chimeric gene results in production of altered levels of a 3-dehydroquinate synthase in the transformed host cell.

8. A method of obtaining a nucleic acid fragment encoding all or a substantial portion of the amino acid sequence encoding a 3-dehydroquinate synthase comprising:

- 30           (a) probing a cDNA or genomic library with the nucleic acid fragment of Claim 1;
- (b) identifying a DNA clone that hybridizes with the nucleic acid fragment of Claim 1;
- (c) isolating the DNA clone identified in step (b); and
- 35           (d) sequencing the cDNA or genomic fragment that comprises the clone isolated in step (c)

wherein the sequenced nucleic acid fragment encodes all or a substantial portion of the amino acid sequence encoding a 3-dehydroquinate synthase.

9. A method of obtaining a nucleic acid fragment encoding a substantial portion of an amino acid sequence encoding a 3-dehydroquinase synthase comprising:

- (a) synthesizing an oligonucleotide primer corresponding to a portion of the sequence set forth in any of SEQ ID NOs:1, 3, 5 and 7; and
- 5 (b) amplifying a cDNA insert present in a cloning vector using the oligonucleotide primer of step (a) and a primer representing sequences of the cloning vector

wherein the amplified nucleic acid fragment encodes a substantial portion of an amino acid sequence encoding a 3-dehydroquinase synthase.

10 10. The product of the method of Claim 8.

11. The product of the method of Claim 9.

12. A method for evaluating at least one compound for its ability to inhibit the activity of a 3-dehydroquinase synthase, the method comprising the steps of:

- 15 (a) transforming a host cell with a chimeric gene comprising a nucleic acid fragment encoding a 3-dehydroquinase synthase, operably linked to suitable regulatory sequences;
- (b) growing the transformed host cell under conditions that are suitable for expression of the chimeric gene wherein expression of the chimeric gene results in production of the 3-dehydroquinase synthase encoded by the operably linked nucleic acid fragment in the transformed host cell;
- 20 (c) optionally purifying the 3-dehydroquinase synthase expressed by the transformed host cell;
- (d) treating the 3-dehydroquinase synthase with a compound to be tested; and
- 25 (e) comparing the activity of the 3-dehydroquinase synthase that has been treated with a test compound to the activity of an untreated 3-dehydroquinase synthase.

thereby selecting compounds with potential for inhibitory activity.